Emissions contributed to Autumn 2000 flood risk

16 February 2011 - Greenhouse gas emissions due to human activity substantially increased the odds of damaging floods occurring in England and Wales in Autumn 2000 according to new research published in the journal Nature this week.

Although the precise magnitude is still uncertain, the researchers found a 2-in-3 chance that the odds were increased by about a factor of two or more.

The study suggests that, although these floods could have occurred in the absence of human influence on climate, greenhouse gas emissions can now be blamed for increasing the odds of floods occurring at that time.

Dr Pardeep Pall, who initiated the research at Oxford University, said: "This study is the first of its kind to model explicitly how such rising greenhouse gas concentrations increase the odds of a particular type of flood event in the UK, and is the first to use publicly volunteered computer time to do so."

Working together

Using a detailed computer climate model, developed at the Met Office Hadley Centre, the project team simulated the weather in Autumn 2000, both as it was, and as it might have been had there been no greenhouse gas emissions since the beginning of the 20th century.

This was then repeated thousands of times using a global volunteer network of personal computers participating in the climate*prediction*.net project in order to pin down the impact of emissions on extreme weather.

In collaboration with Risk Management Solutions (RMS), developers of risk models for the insurance industry, the team then fed the output from these weather simulations into a flood model, and found that 20th century greenhouse gas emissions very likely increased the chances of floods occurring in autumn 2000 by more than 20%; and likely by 90% (close to doubling the odds) or more.

Scientific evidence

Lord Henley, Environment Minister, said: "I welcome this research which is the first to attribute how rising greenhouse gas concentrations may increase the chance of a particular flood. This work reinforces the scientific evidence on the need for the UK to tackle climate change, and to increase our resilience to the challenges climate change will bring from extreme weather events."

Dr Peter Stott, of the Met Office, and a co-author of the report, said: "This study is the first step toward near real-time attribution of extreme weather, untangling natural variability from man-made climate change.

"This research establishes a methodology that can answer the question about how the odds of particular weather events may be altering. It will also allow us to say, shortly after it has occurred, if a specific weather event has been made more likely by climate change, and equally importantly if it has not."

Developing the science

The Met Office Hadley Centre has been commissioned by DECC, Defra and DfID to work with international partners as part of the Attribution of Climate-related Events Group. The group is developing the science of attribution of extreme weather that will be needed to provide regular and scientifically robust assessments of how the odds of these phenomena are changing.

Contact information

Met Office Press Office: **+44 (0)1392 886655**

E-mail: Press Office

Met Office Customer Centre: **01392 885680**

If you're outside the UK: **+44 1392 885680**

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